

REMARKS/ARGUMENTS

1.) Claim Amendments

The Applicant has amended claims 21, 27 and 36 and cancelled claim 24. Accordingly, claims 21-23 and 25-40 remain pending in the application. Favorable reconsideration of the application is respectfully requested in view of the foregoing amendments and the following remarks.

2.) Examiner Objections – Drawings

The Examiner objected to Figure 3 of the drawings for failing to label concave mirror 10. The Applicants submit herewith a “formal” replacement sheet adding reference numeral 10. The Examiner’s approval of the drawing is respectfully requested.

3.) Examiner Objections – Specification

The Examiner objected to the specification because the abstract of the disclosure is listed in the corresponding PCT document. In response to the Examiner’s request, the Applicants submit herewith a “fresh” copy of the abstract (*i.e.*, on a separate sheet).

4.) Claim Rejections – 35 U.S.C. §103(a)

The Examiner rejected claims 24 and 26-40 as being unpatentable over Rivoallan, *et al.* (U.S. Patent No. 4,802,729) in view of Morgenthal, *et al.* (DE 19722415 A1). Claim 21 has been amended to include the limitation of claim 24 and, thus, the Applicants will address the Examiner’s rejection of claim 24 with respect to amended claim 21.

Claim 21, as amended, recites:

21. A device for fusion splicing ends of two optical fibers to each other comprising:

retainers for optical fibers adapted to hold ends of two optical fibers with end surfaces placed at each other in a splice position;

a CO₂ laser emitting light to the splice position, wherein the emission wavelength of the CO₂ laser is substantially 9.3 μ m +/- 0.4 μ m;
and,

a mirror having a curved concave surface located to deflect a collimated direct light beam emitted by the CO₂ laser towards the splice position and to make it converge to a focus in the direction of the splice position, the splice position located at a distance of the collimated direct light beam. (emphasis added).

The Examiner has not pointed to a teaching in Rivollan or Morgenthal of the important feature that the CO₂-laser has an emission wavelength of substantially 9.3 μm (+/- 0.4 μm). Furthermore, contrary to the Examiner's assertion, the Applicants' identification of an optimal wavelength is non-trivial and not directly recognizable to one of merely ordinary skill in the art.

The prior art, as indicated by the teachings of Rivollan and Morgenthal, utilizes a conventional monomode 10.6 μm CO₂-laser due to the need for strong focusing of the laser beam and the high power used. (see col. 4, line 62) To use a 9.3 μm CO₂-laser instead of a conventional 10.6 μm CO₂-laser is unique within the field of fiber splicing and has the advantage, recognized by Applicants, that the energy absorption of conventional silica fibers is increased from 15-30% to up to 70-90%. Thus, the dimensions of the laser can be smaller. Furthermore, a large beam spot of 200-300 μm can be used, thereby requiring less complicated focusing means and less exact positioning of the beam spot. Additionally, no feedback control system of the laser power is needed since the wavelength 9.3 μm is located in the middle of the absorption band of silica glass, while the wavelength 10.6 μm is located in a sloping section of the wavelength absorption profile; see Figure 1, and the description thereof, in Applicant's specification. Therefore, Rivollan and Morgenthal fail to teach, much less suggest, the invention recited in claim 21 and, therefore, the Examiner has failed to establish a *prima facie* case of obviousness.

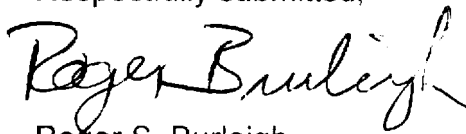
Whereas claim 36 recites limitations analogous to those of claim 21, that claim is also not obvious over Rivollan in view of Morgenthal. Furthermore, whereas claims 22-23 and 25-35 are dependent from claim 21 and claims 37-40 are dependent from claim 36, and include the limitations of their respective base claims, those claims are also patentable over Rivollan in view of Morgenthal.

CONCLUSION

In view of the foregoing amendments and remarks, the Applicant believes all of the claims currently pending in the Application to be in a condition for allowance. The Applicant, therefore, respectfully requests that the Examiner withdraw all rejections and issue a Notice of Allowance for claims 21-23 and 25-40.

The Applicants request a telephonic interview if the Examiner has any questions or requires any additional information that would further or expedite the prosecution of the Application.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Roger Burleigh", with a stylized flourish at the end.

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